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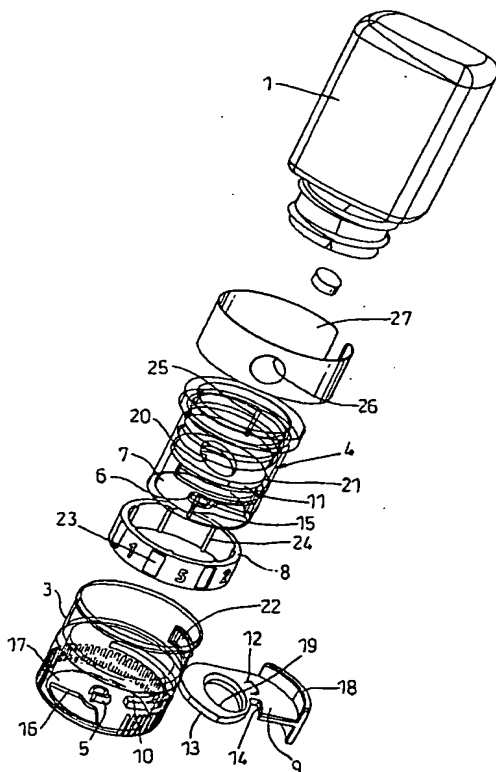
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[Continued on next page]

(54) Title: PILL DISPENSING DEVICE



(57) Abstract: A pill dispensing cap for a bottle has an inner sleeve (4) with a divider panel (21) and a first base panel (7) rotatable within an outer sleeve (3) having a second base panel (17). First and second window openings (15, 16) are defined in the first and second base panels. A plate (9) moveable across and within the two sleeves defines a third window opening (19) and a fourth window opening (20) is defined in the divider panel (21). The plate (9) can be held in an initial position wherein the first and second windows (15, 16) are aligned, whilst the third and fourth windows (19, 20) are not aligned. The outer sleeve (4) is rotatable to a condition wherein the first and second windows are not aligned and the plate (9) can then be slid across to a condition wherein the third and fourth windows (19, 20) are aligned to allow pills in a bottle to enter the inner sleeve (4). Replacement of the plate (9) to its initial condition allows the outer sleeve (3) to be rotated back to its initial condition, thus allowing pills to be dispensed from the inner container (4) via the aligned first and second windows (15, 16).

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PILL DISPENSING DEVICE

There is a need for a device for attachment to a pill bottle to enable correct doses of pills to be determined by the user for dispensing at a required time. There are a number of such devices in existence, but the invention aims to provide such a device which is relatively easy to operate and is not complex in construction.

According to the present invention there is provided a pill dispensing cap for a bottle having inner and outer sleeves, the inner sleeve having an intermediate divider panel and a first base panel and the outer sleeve having a second base panel located immediately below the first base panel, first and second window openings defined in the first and second base panels, a plate moveable across and within the two sleeves and defining a third window opening, a fourth window opening defined in said divider panel, and a releasable locking arrangement whereby the plate can be held in an initial position wherein the first and second windows are aligned, whilst the third and fourth windows are not aligned, the outer sleeve being rotatable forwardly to a condition wherein the first and second windows are not aligned and the locking of the plate is released to enable the plate to be slid across to a condition wherein the third and fourth windows are aligned to allow pills in a bottle to enter the inner sleeve, replacement of the plate to its initial condition then allowing the outer sleeve to be rotated back to its initial condition, thus allowing pills to be dispensed from the inner container via the aligned first and second windows.

With this type of arrangement of a dispensing cap, pills can be released from a bottle into the inner sleeve when the plate has been slid across within the

two sleeves to allow pills to be dispensed through the aligned third and fourth windows. The user can ensure that the correct number of pills are present within the dispensing cap before the plate is moved back to its initial condition, thus closing off the alignment of the third and fourth windows. The outer sleeve
5 is then rotated to the initial condition to allow the pills to be dispensed to the user through the first and second windows.

The locking arrangement for holding the plate in the initial condition can be a notch in the plate into which the end of a groove in the outer container, receiving said plate, can be located.

10 Ideally, the plate will be spring loaded into the initial condition wherein part of the plate projects outwardly of the two sleeves, thus into a "fail safe" condition.

The plate desirably carries a boss limiting the extent of outward projection of the plate from the two sleeves.

15 The inner and outer sleeves may simply be interconnected by a snap-fit arrangement which allows for rotation of the outer sleeve.

Ideally, the cap will additionally enable the user to see how many doses have been dispensed, either by indicating the total number of doses or, for example, indicating the last day on which a dose was dispensed. Thus, the cap
20 can include an indicator ring positioned between the two sleeves and movable upon rotation of the outer sleeve between separate ones of a series of temporary locating formations on the inner sleeve. In the preferred arrangement a ratchet leg is provided on the outer sleeve for cooperation with one of a series of ratchet teeth or grooves on the outer face of the indicator ring, designed to

enable rotation of the indicator ring with the outer sleeve only in one direction of rotation of the outer sleeve. The indicator ring can carry notations of the number of doses of pills supplied by the cap through a viewing window.

The invention may be performed in various ways and a preferred example thereof will now be described, with reference to the accompanying diagrammatic drawings, in which:

Figure 1 is a side perspective view of a pill dispensing cap of this invention;

Figure 2 is a view similar to Figure 1, but during an initial stage of operation of the cap; and

Figure 3 is an exploded perspective view of the various parts of the pill dispensing cap of Figures 1 and 2.

As shown in the drawings, a standard pill bottle 1 has a pill dispensing cap 2 screwed onto the mouth of the bottle. If desired, this interconnection can incorporate a standard tamper proof interlocking arrangement which prevents inadvertent removal of the cap from the bottle. As can be seen more readily from Figure 3; the cap incorporates an outer sleeve 3 and an inner sleeve 4, both of which are formed from a transparent plastics material. The sleeve 4 is secured within the sleeve 3 by a snap-fit location arrangement comprising a split spigot 5 locating into a locking hole 6 in the base panel 7 of the inner sleeve 4. Trapped between the inner and outer sleeves is an indicator ring 8. A plate 9 is slidably received through grooves 10 and 11 respectively formed in the sleeves 3 and 4. A snap-locating locking boss 12 limits the extent of removal of the plate from within the sleeves 3 and 4 and a biasing leaf spring 13 acts to push the

plate outwardly to that limit.

In a normal condition, as shown in Figure 1, the plate 9 is in its outward condition and the outer sleeve 3 will have been rotated anti-clockwise to an extent whereby the end of the groove 11 will locate within a notch 14 of the plate 9. In this condition a first window 15 in the base panel 7 of the inner sleeve 4 is aligned with a second window 16 in a base panel 17 of the outer sleeve 3. The outer sleeve is then rotated clockwise so that the first and second windows 15 and 16 are no longer aligned and the interengagement of the groove 11 of the notch 14 is released. The plate 9 can now be pushed inwardly, by pressing on a finger plate 18, resulting in alignment of a third window 19 in the plate 9 with a fourth window 20 in a divider panel 21 within the inner sleeve 4. Pills within the bottle 1 can now be shaken out through the aligned windows 19 and 20 into the lower part of the inner sleeve 4. Once the user is satisfied that the correct number of pills are present within the inner sleeve 4, the plate 9 is released so that it moves outwardly under the bias of the spring 13 (and/or by pulling on the finger plate 18) so that the windows 19 and 20 are no longer aligned. The outer sleeve 3 is then rotated anti-clockwise back to the start position with the result that the windows 15 and 16 come into alignment. This allows the dose of pills to be released from the lower part of the inner sleeve 4 to the user.

When the outer sleeve 3 is initially rotated in a clockwise direction, a ratchet leg 22 is allowed to ride past ratchet grooves (or teeth) 23 on the indicator ring 8. However, when the outer sleeve 3 is rotated back in the anti-clockwise direction the ratchet leg 22 will engage with one of the ratchet grooves 23 and index round the indicator ring 8, overcoming engagement of locating ribs

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24 with locating grooves 25 on the outer face of the inner sleeve 4. When the movement is completed, the locator ribs 24 will re-engage with the grooves 25, but with the indicator ring in the next position. The indicator ring 8 carries the numerals 1 to 7 in the sequence 1, 5, 2, 6, 3, 7, 4, which represent the number of doses or days of the week (letters for days of the week could equally well be employed). The indexing round of the indicator ring is such that the next number aligned with a viewing window 26 in a label 27 is two spaces on.

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CLAIMS

1. A pill dispensing cap for a bottle having inner and outer sleeves, the inner sleeve (4) having an intermediate divider panel (21) and a first base panel (7) and the outer sleeve (3) having a second base panel (17) located immediately below the first base panel, first and second window openings (15, 16) defined in the first and second base panels, a plate (9) moveable across and within the two sleeves and defining a third window opening (19), a fourth window opening (20) defined in said divider panel, and a releasable locking arrangement (14, 11) whereby the plate can be held in an initial position wherein the first and second windows (15, 16) are aligned, whilst the third and fourth windows (19, 20) are not aligned, the outer sleeve (4) being rotatable forwardly to a condition wherein the first and second windows are not aligned and the locking of the plate is released to enable the plate (9) to be slid across to a condition wherein the third and fourth windows (19, 20) are aligned to allow pills in a bottle to enter the inner sleeve (4), replacement of the plate (9) to its initial condition then allowing the outer sleeve (3) to be rotated back to its initial condition, thus allowing pills to be dispensed from the inner container (4) via the aligned first and second windows (15, 16).
2. A cap according to claim 1, wherein the locking arrangement is a notch (14) in the plate into which the end of a groove (11) in the outer container, receiving said plate, can be located.
3. A cap according to claim 2 or claim 3, wherein the inner and outer sleeves are interconnected by a snap-fit arrangement (24, 25) which allows for rotation of the outer sleeve.

4. A cap according to any one of claims 1 to 3, wherein the plate is spring loaded (13) into the initial condition wherein part of the plate projects outwardly of the two sleeves.
5. A cap according to claim 4, wherein the plate carries a boss (12) limiting the extent of outward projection of the plate from the two sleeves.
6. A cap according to any one of claims 1 to 5, including an indicator ring (8) positioned between the two sleeves and movable upon rotation of the outer sleeve between separate ones of a series of temporary locating formations (25) on the inner sleeve.
- 10 7. A cap according to claim 6, wherein a ratchet leg (22) is provided on the outer sleeve (3) for cooperation with one of a series of ratchet teeth or grooves (23) on the outer face of the indicator ring, designed to enable rotation of the indicator ring (8) with the outer sleeve only in one direction of rotation of the outer sleeve.
- 15 8. A cap according to claim 6 or claim 7, wherein the indicator ring carries notations of the number of doses of pills supplied by the cap through a viewing window.
9. A pill dispensing cap for a bottle substantially as herein described with reference to the accompanying drawings.
- 20 10. Any novel combination of features of a pill dispensing cap as herein described and/or as illustrated in the accompanying drawings.

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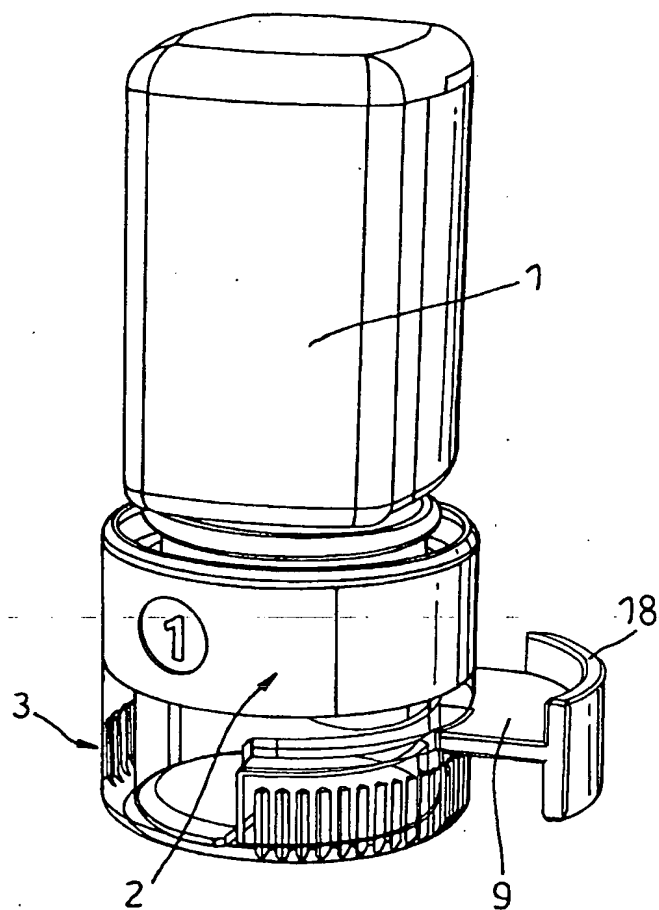


Fig. 1

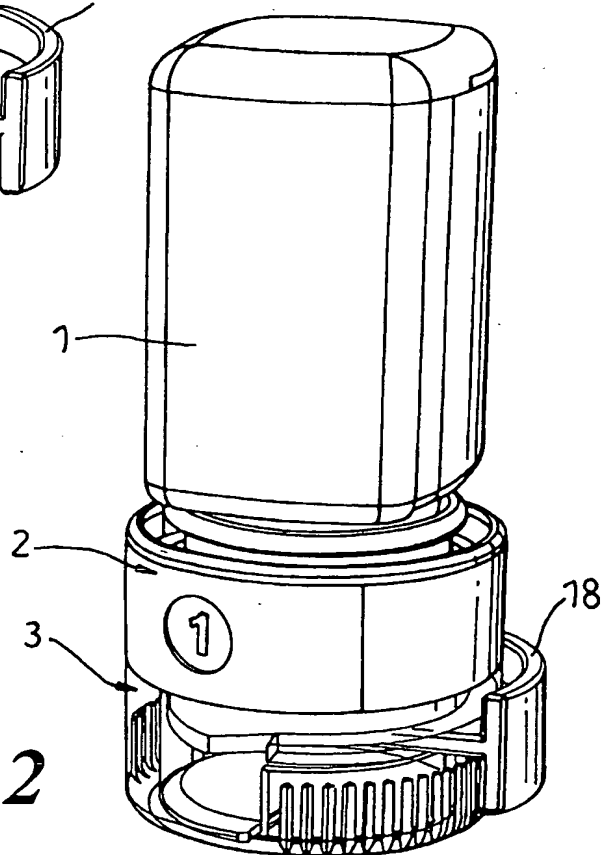
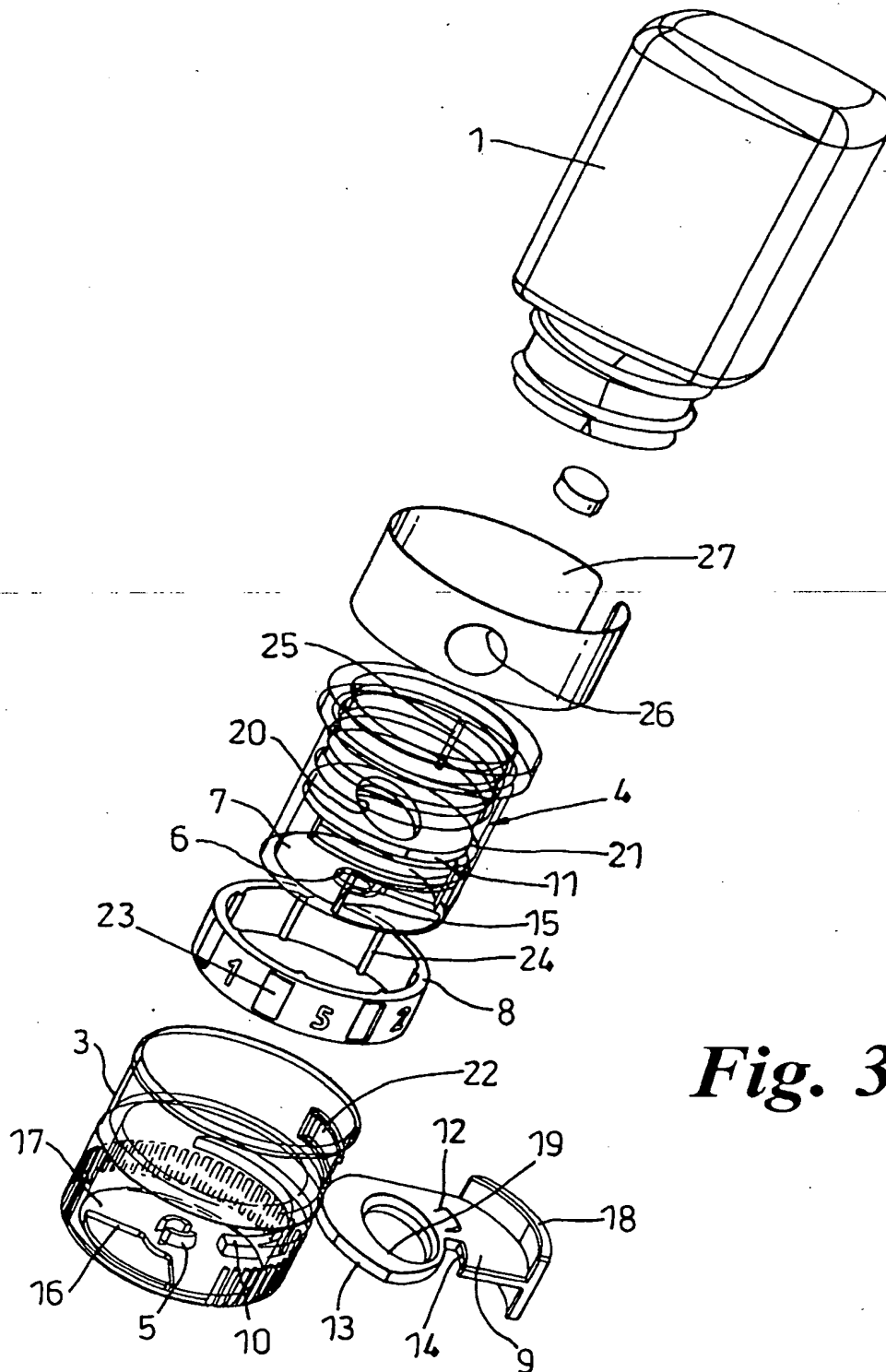


Fig. 2

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*Fig. 3*

INTERNATIONAL SEARCH REPORT

PCT/GB2004/002072

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 B65D83/04

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 3 730 387 A (MCCONNELL J ET AL) 1 May 1973 (1973-05-01) the whole document	1-8
A	WO 95/05329 A (MALDONADO ANGEL ANTONIO) 23 February 1995 (1995-02-23) the whole document	1-8
A	FR 2 745 554 A (SUPPO STERIL LAB) 5 September 1997 (1997-09-05) the whole document	1-8
A	FR 2 396 697 A (SUPPO STERIL LABORATOIRES) 2 February 1979 (1979-02-02) the whole document	1-8

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *8* document member of the same patent family

Date of the actual completion of the international search

21 October 2004

Date of mailing of the international search report

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INTERNATIONAL SEARCH REPORT

PCT/GB2004/002072

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.: 9, 10
because they relate to subject matter not required to be searched by this Authority, namely:
Rule 6.2a of the PCT
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.



INTERNATIONAL SEARCH REPORT

Information on patent family members

PCT/GB2004/002072

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 3730387	A	01-05-1973	NONE	
WO 9505329	A	23-02-1995	ES 1025614 U1 AU 7500294 A WO 9505329 A1	16-01-1994 14-03-1995 23-02-1995
FR 2745554	A	05-09-1997	FR 2745554 A1	05-09-1997
FR 2396697	A	02-02-1979	FR 2396697 A1	02-02-1979



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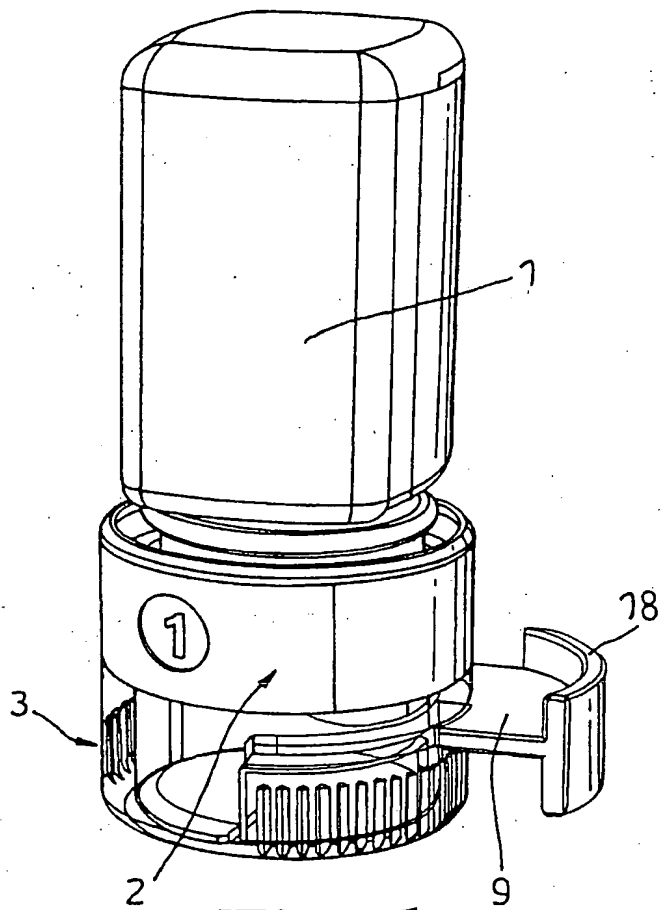


Fig. 1

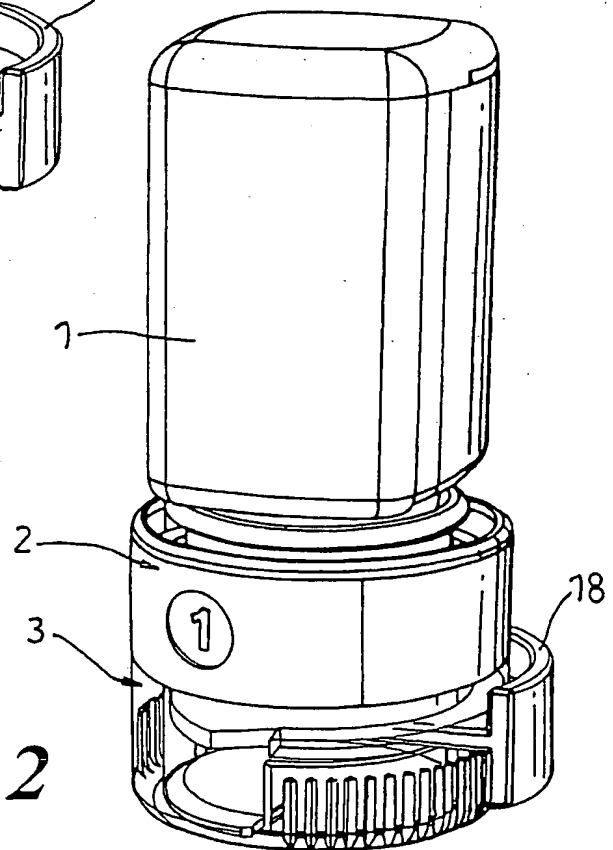


Fig. 2

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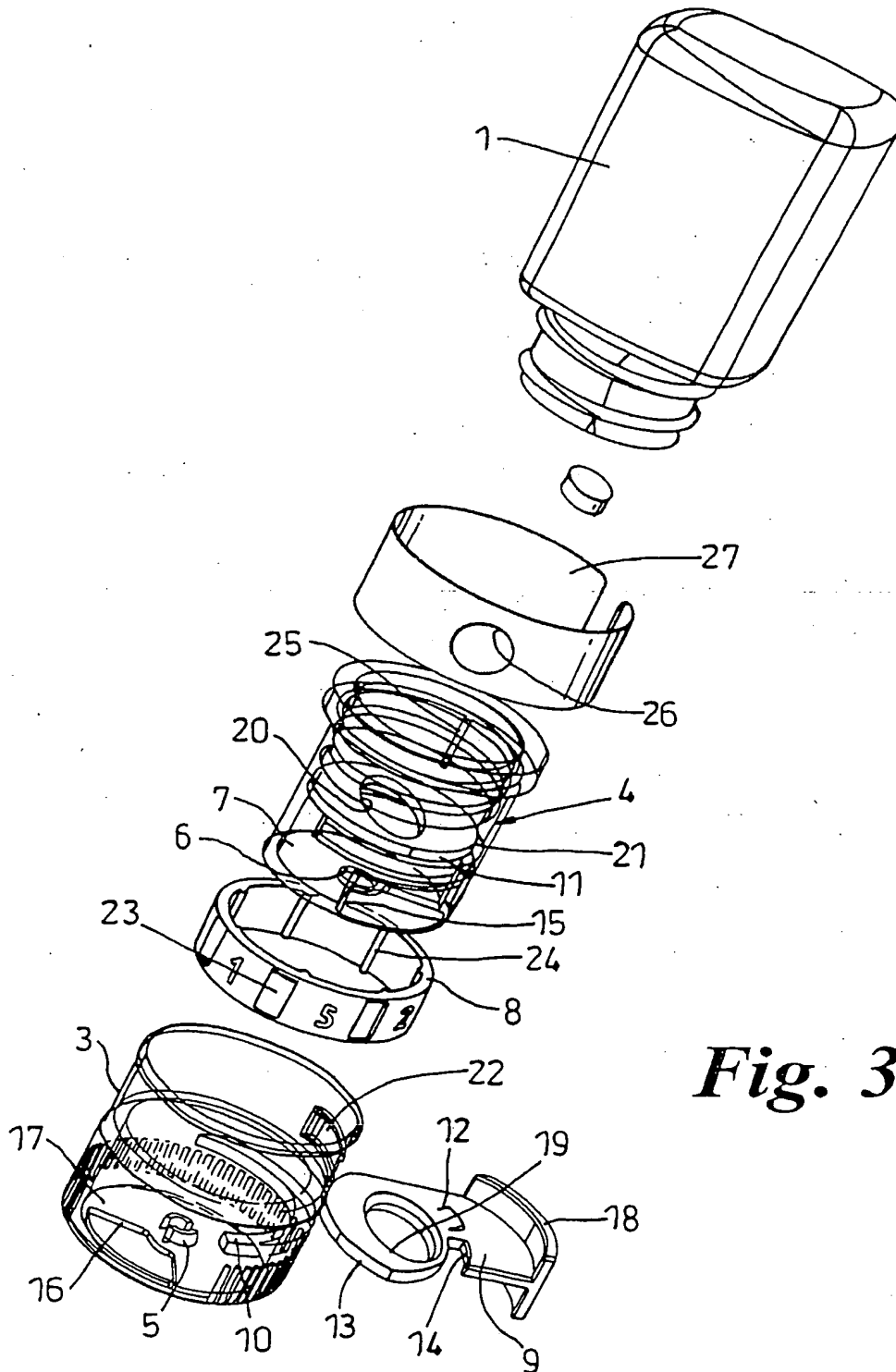


Fig. 3